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Publish statement

Thank you for purchasing this series UPS.
This series UPS is an intelligent, Three phase in Three phase out, high frequency online UPS designed by our R&D team who is with years of designing experiences on UPS. With excellent electrical performance, perfect intelligent monitoring and network functions, smart appearance, complying with EMC and safety standards, The UPS meets the world's advanced level.
Read this manual carefully before installation
This manual provides technical support to the operator of the equipment.

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1. Safety

Important safety instructions – Save these instructions

There exists dangerous voltage and high temperature inside the UPS. During the installation, operation and maintenance, please abide the local safety instructions and relative laws, otherwise it will result in personnel injury or equipment damage. Safety instructions in this manual act as a supplementary for the local safety instructions. Our company will not assume the liability that caused by disobeying safety instructions.

1.1 Safety notes

1. Even no connection with utility power, 220/230/240VAC voltage may still exist at UPS outlet!
2. For the sake of human being safety, please well earth the UPS before starting it.
3. Don't open or damage battery, for the liquid spilled from the battery is strongly poisonous and do harmful to body!
4. Please avoid short circuit between anode and cathode of battery, otherwise, it will cause spark or fire!
5. Don't disassemble the UPS cover, or there may be an electric shock!
6. Check if there exists high voltage before touching the battery
7. Working environment and storage way will affect the lifetime and reliability of the UPS. Avoid the UPS from working under following environment for long time
   - ◆ Area where the humidity and temperature is out of the specified range(temperature 0 to 40℃, relative humidity 5%-95%)
   - ◆ Direct sunlight or location nearby heat
   - ◆ Vibration Area with possibility to get the UPS crashed.
   - ◆ Area with erosive gas, flammable gas, excessive dust, etc
8. Keep ventilations in good conditions otherwise the components inside the UPS will be over-heated which may affect the life of the UPS.

1.2 Symbols used in this guide

WARNING!

Risk of electric shock

CAUTION!

Read this information to avoid equipment damage

2. Main Features

2.1 Summarization

This series UPS is a kind of three-in-three-out high frequency online UPS, it provides seven specifications: The 100kVA/120kVA/160kVA. The UPS can solve most of the power supply problems, such as blackout, over-voltage, under-voltage, voltage sudden drop, oscillating of decreasing extent, high voltage pulse, voltage fluctuation, surge, inrush current, harmonic distortion (THD), noise interference, frequency fluctuation, etc..

This UPS can be applied to different applications from computer device, automatic equipment, communication system to industry equipment.

2.2 Functions and Features

◆3Phase In/3Phase Out UPS

It is 3Phase In/3Phase Out high-density UPS system, of which input current is kept in balance. No unbalance problem might occur.

◆Digital Control

This series UPS is controlled by Digital Signal Processor(DSP); ehance, it increases reliability, performance, self-proteciton, self-diagnostics and so on.

◆Battery Configurable from 32 blocks to 40 blocks

The battery voltage of this series UPS can be configured at 32 blocks, 34 blocks, 36 blocks, 38 blocks or 40 blocks according to your convenience.

◆Charging Current is configurable

The user may set the capacity of the batteries as well as reasonable charging current. Constant voltage mode, constant current mode or floating mode can be switched automatically and smoothly.

◆Intelligent Charging Method

The series UPS adopts advanced three-stage charging method—

1st stage: high current constant current charging

to guarantee to charge back to 90%;

2nd-stage: Constant Voltage

In order to vitalize battery and make sure batteries are fully charged

3rd stage: floating mode.

With this 3-stage charging method, it extends the life of the batteries and guarantees fast charging.

◆LCD Display

With LCD plus LED displays, the user may easily get UPS status and its operational parameters, such as input/output voltage, frequency & load%, battery % and ambient temperature, etc..

◆Intelligent Monitoring Function

Via optional SNMP Card, you may remotely control and monitor the UPS.

◆EPO Function

The series UPS may be completely shut off when the EPO is pressed. REPO

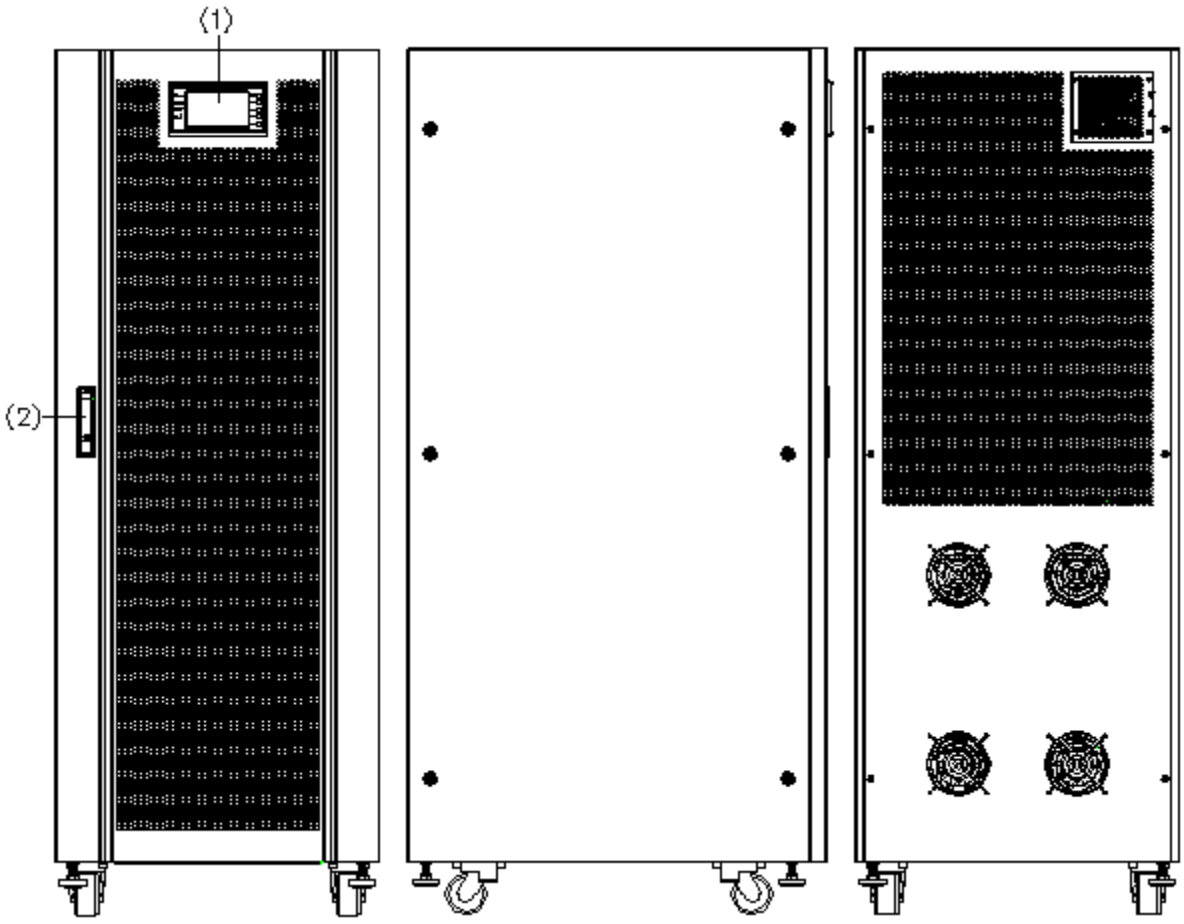
function(Remote EPO) is also available in this series UPS.

3. Installation

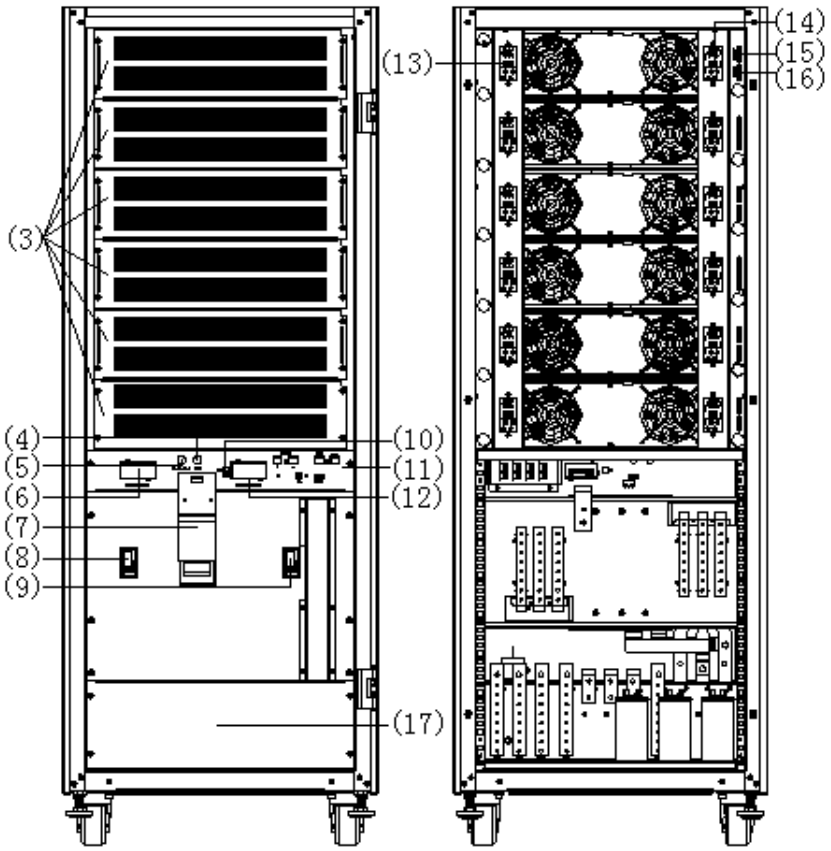
3.1 Unpack checking

1. Don’t lean the UPS when moving it out from the packaging
2. Check the appearance to see if the UPS is damaged or not during the transportation, do not switch on the UPS if any damage found. Please contact the dealer right away.
3. Check the accessories according to the packing list and contact the dealer in case of missing parts.

3.2 The appearance of the product

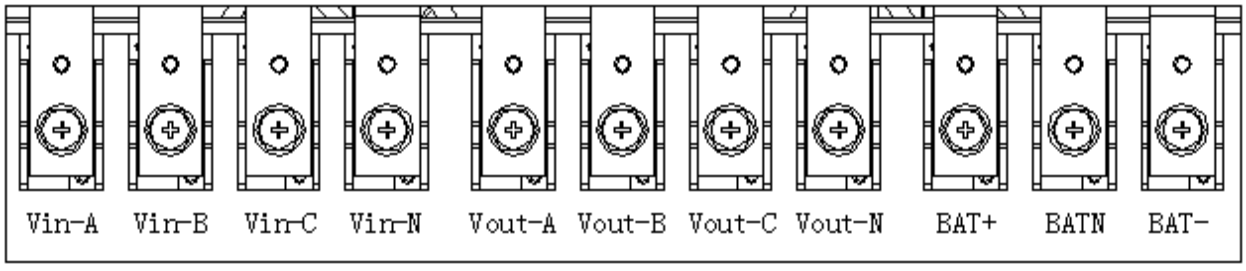


Front View **Side View** **Rear View**



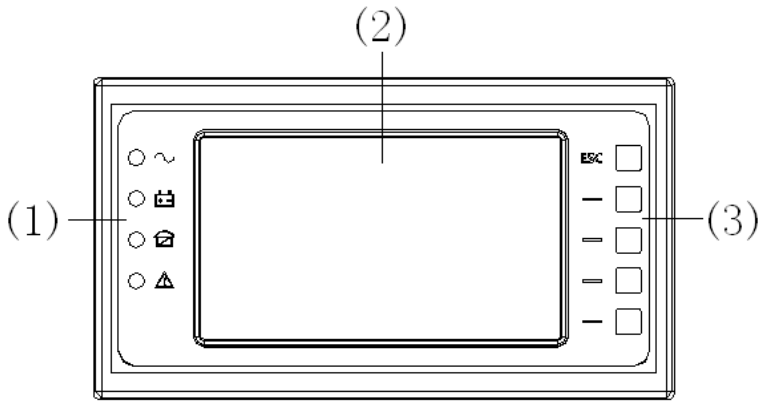
Front View（internal） **Rear View（internal）**

(1) LCD panel	(2) Front lock
(3) UPS Module	(4) EPO switch
(5) Blackstart switch	(6) Intelligent Solt（SNMP card/Relay card）
(7) Maintenance switch & its cover	(8) I/P Switch
(9) O/P Switch	(10) REPO
(11) Communication port SNMP/R232/R485）	(12) Intelligent Solt（SNMP card/Relay card）
(13) Input connector slot of UPS Module	(14) Output connector slot of UPS
(15) Parallel port 1	(16) Parallel port 2
(17) Terminal Block cover	



Terminal Block（terminal block without cover）

3.4 LCD control panel



LCD control panel introduction

（1）LED（from top to bottom: “mains output”, “bypass output”、“battery output”、“alarm”）

（2）LCD display

（3）Founction button

3.5 Installation notes

Note: Consider for the convenience of operation and maintenance, the space in front and back of the cabinet should be left at least 100cm and 80cm respectively when installing the cabinet .

◆Please place the UPS in a clean, stable environment, avoid the vibration, dust, humidity, flammable gas and liquid, corrosive. To avoid from high room temperature, a system of room extractor fans is recommended to be installed. Optional air filters are available if the UPS operates in a dusty environment.

◆The environment temperature around UPS should keep in a range of 0 ℃-40 ℃. If the environment temperature exceeds 40 ℃, the load capacity should be reduced by 12 % per 5 ℃. The max temperature can’t be higher than 50℃.

◆If the UPS is dismantled under low temperature, it might be in a condensing condition.The UPS can't be installed unless the internal and external of the equipment is fully dry. Otherwise, there will be in danger of electric shock.

◆Batteries should be mounted in an environment where the temperature is within the required specs. Temperature is a major factor in determining battery life and capacity. In a normal installation, the battery temperature is maintained between 15°C and 25°C. Keep batteries away from heat sources or main air ventilation area, etc.

WARNING!
Typical battery performance data are quoted for an operating temperature between 20°C and 25°C. Operating it above this range will reduce the battery life while operation below this range will reduce the battery capacity.

◆Should the equipment not be installed immediately it must be stored in a room so as to protect it against excessive humidity and or heat sources。

CAUTION!

An unused battery must be recharged every 6months Temporarily connecting the UPS to a suitable AC supply mains and activating it for the time required for recharging the batteries.

◆The highest altitude that UPS may work normally with full load is 1500 meters. The load capacity should be reduced when this UPS is installed in place whose altitude is higher than 1500 meters, shown as the following table:

（Load coefficient equals max load in high altitude place divided by nominal power of the UPS）

Altitude（m）	1500	2000	2500	3000	3500	4000	4500	5000
Load coefficient	100%	95%	90%	85%	80%	75%	70%	65%

◆The UPS cooling is depending on fan, so it should be kept in good air ventilation area. There are many ventilation holes on the front and rear, so they should not be blocked by any exotic obstacles.

3.6 External Protective Devices

For safety reasons, it is necessary to install, external circuit breaker at the input A.C. supply and the battery. This chapter provides guidelines for qualified installers that must have the knowledge of local wiring practices for the equipment to be installed.

◆External Battery

The UPS and its associated batteries are protected against the effect of over-current through a DC compatible thermo-magnetic circuit-breaker (or a set of fuses) located close to the battery.

◆UPS Output

Any external distribution board used for load distribution shall be fitted with protective devices that may avoid the risk of UPS overloaded.

◆Over-current

Protection device shall be installed at the distribution panel of the incoming main supply. It may identify the power cables current capacity as well as the overload capacity of the system .

CAUTION !

Select a thermo magnetic circuit-breaker with an IEC 60947-2 trip curve C (normal) for 125% of the current as listed below.

3.7 Power Cables

◆The cable design shall comply with the voltages and currents provided in this section, Kindly follow local wiring practices and take into consideration the environmental conditions (temperature and physical support media) .

WARNING !

UPON STARTING, PLEASE ENSURE THAT YOU ARE AWARE OF THE LOCATION AND OPERATION OF THE EXTERNAL ISOLATORS WHICH ARE CONNECTED TO THE UPS INPUT/BYPASS SUPPLY OF THE MAINS DISTRIBUTION PANEL.CHECK TO SEE IF THESE SUPPLIES ARE ELECTRICALLY ISOLATED, AND POST ANY NECESSARY WARNING SIGNS TO PREVENT ANY INADVERTENT OPERATION

◆For future expansion purpose, it is economical to install power cable according to the full rating capacity initially. The diameter of cable is shown bellow：

UPS cabinet	Cable Dimension			
	AC Input (mm^2)	AC Output (mm^2)	DC Input (mm^2)	Grounding (mm^2)
100	50	50	95	25
120	70	50	120	35
160	95	70	95*2	50

CAUTION!

Protective earth cable: Connect each cabinet to the main ground system. For Grounding connection, follow the shortest route possible。

WARNING!

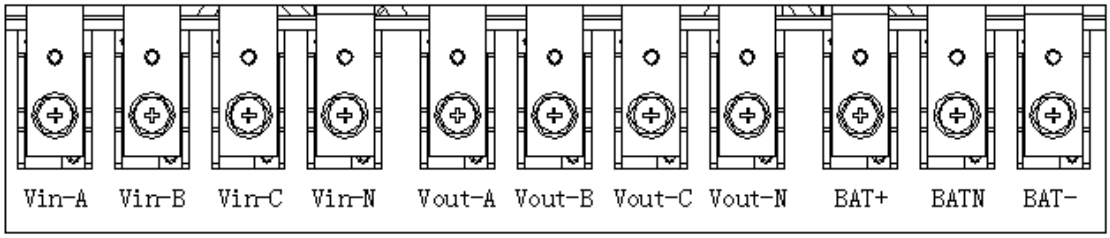
FAILURE TO FOLLOW ADEQUATE EARTHING PROCEDURES MAY RESULT IN ELECTROMAGNETIC INTERFERENCE OR IN HAZARDS INVOLVING ELECTRIC SHOCK AND FIRE

3.8 Power cable connect

Once the equipment has been finally positioned and secured, connect the power cables as described in the following procedure.

Verify the UPS is totally isolated from its external power source and also all power isolators of the UPS are open. Check to see if they are electrically isolated, and post any necessary warning signs to prevent their inadvertent operation .

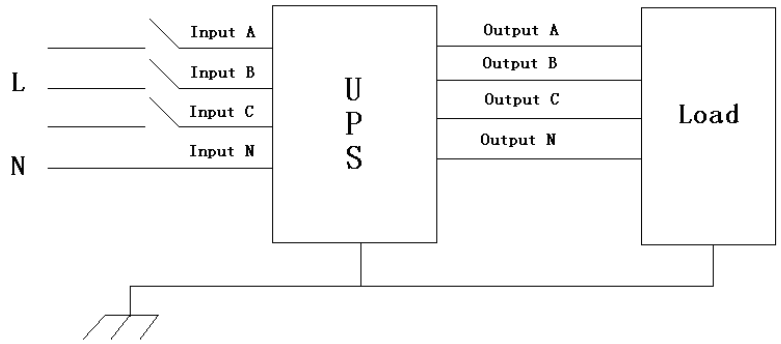
Open the UPS rear panel, remove the cover of terminals for wiring easily.



Terminal sequence from left to right: Input phase A(L1), input phase B(L2), input phase C(L3), input Neutral line, output phase A(L1), output phase B(L2), output phase C(L3), output Neutral line, battery positive, battery Neutral, battery negative. The termnial block's left & right ends each has a connector for Ground.

Choose appropriate power cable.（Refer to the table above）and pay attention to the diameter of the connection terminal of the cable that should be greater than or equal to that of the connection poles;

Wiring



WARNING!

If the load equipment is not ready to accept power on the arrival of the commissioning engineer then ensure that the system output cables are safely isolated at their ends

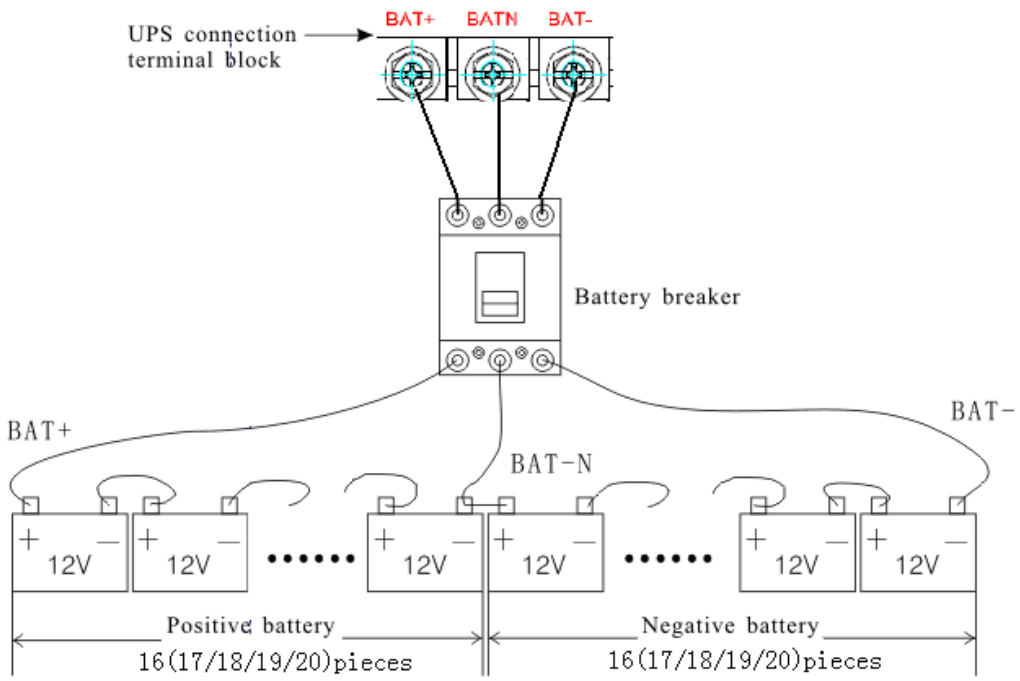
Connect the safety earth and any necessary bonding earth cables to the copper earth screw located on the floor of the equipment below the power connections. All cabinets in the UPS must be grounded properly.

CAUTION!

The earthing and neutral bonding arrangement must be in accordance with local and national codes of practice.

3.9 Battery connection

The UPS adopts positive and negative double battery framework, total 32(optional 34/36/38/40) in series. A neutral cable is retrieved from the joint between the cathode of the 16th (17th/18 th/19th/20 th) and the anode of the 17th (18th/19 th/20th/21 th) of the batteries. Then the neutral cable, the battery Positive and the battery negative are connected with the UPS respectively. The battery sets between the Battery anode and the neutral are called positive batteries and that between neutral and cathode are called negative ones. The user can choose the capacity and the numbers of the batteries according to their desire.



Note：

The BAT+ of the UPS connect poles is connected to the anode of the positive battery, the BAT-N is connected to the cathode of the positive battery and the anode of the negative battery, the BAT- is connected to the cathode of the negative battery。

Factory setting of the long-run unit is battery quantity---32pcs, battery capacity---12V65AH. When connecting 32/34/38/40 batteries, please re-set desired battery quantity and its capacity after UPS starts at AC mode. Charger current could be adjusted automatically according to battery capacity selected. All related settings can be done through LCD panel or monitoring software.

CAUTION!

Ensure correct polarity battery string series connection. i.e. inter-tier and inter block connections are from (+) to (-)terminals.

Don’t mix batteries with different capacity or different brands, or even mix up new and old batteries, either.

WARNING!

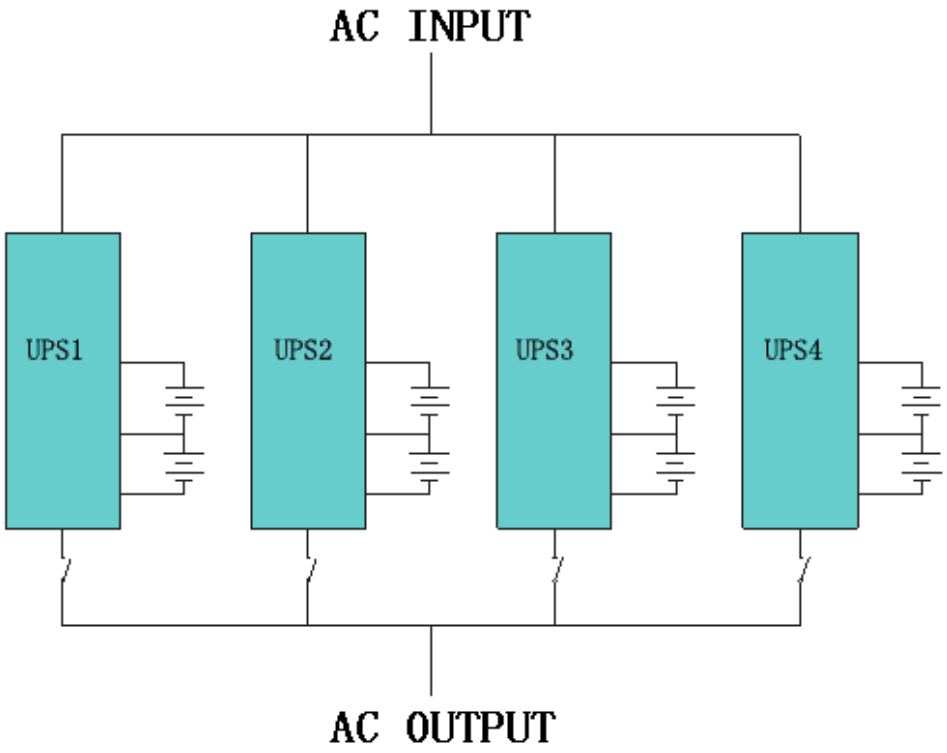
Ensure correct polarity of string end connections to the Battery Circuit Breaker and from the Battery Circuit Breaker to the UPS terminals i.e. (+) to (+) / (-) to (-) but disconnect one or more battery cell links in each tier. Do not reconnect these links and do not close the battery circuit breaker unless authorized by the commissioning engineer.

3.10 UPS Multi－Module Installation

The basic installation procedure of a parallel system comprising of two or more UPS modules is the same as that of single module system. The following sections introduce the installation procedures specified to the parallel system.

3.10.1 Cabinet installation

Connect all the UPSes needed to be put into parallel system as below picture.



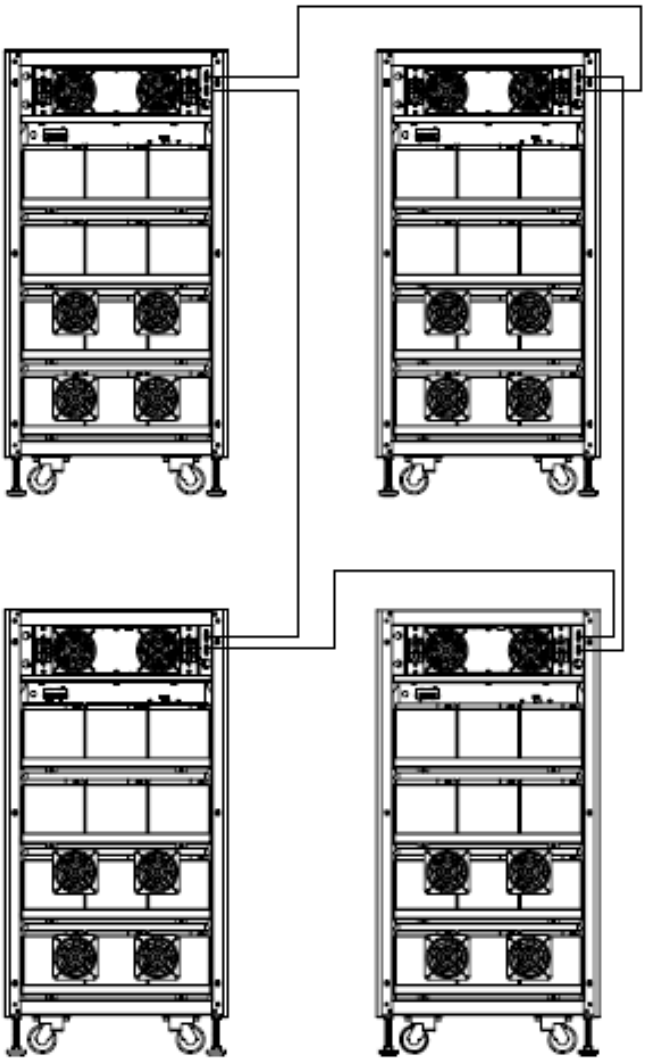
Make sure each UPS input breaker is in “off” position and there is no any output from each UPS connected. Battery groups can be connected separately or in parallel, which means the system itself provides both separate battery and comman battery.

WARNING!

Make sure the N、A（L1）、B（L2）、C（L3）lines are correct, and grouding is well connected.

3.10.2 Parallel cable installation

Shielded and double insulated control cables available must be interconnected in a ring configuration between UPS modules as shown below. The parallel control board is mounted on each UPS module. The ring configuration ensures high reliability of the control.



4. Operation

4.1 Operation Modes

The UPS is a double-conversion on-line UPS that may operate in the following alternative modes：

◆Normal mode

The rectifier/charger derives power from the AC Mains and supplies DC power to the inverter while floating and boosting charge the battery simultaneously. Then, the inverter converts the DC power to AC and supplies to the load.

◆Battery mode (Stored Energy Mode)

If the AC mains input power fails, the inverter, which obtains power from the battery, supplies the critical AC load. There is no power interruption to the critical load. The UPS will automatically return to Normal Mode when AC recovers.

◆Bypass mode

If the inverter is out of order, or if overload occurs, the static transfer switch will be activated to transfer the load from the inverter supply to bypass supply without interruption to the critical load. In the event that the inverter output is not synchronized with the bypass AC source, the static switch will perform a transfer of the load from the inverter to the bypass with power interruption to the critical AC load. This is to avoid paralleling of unsynchronized AC sources. This interruption is programmable but typically set to be less than an electrical cycle e.g. less than 15ms (50Hz) or less than 13.33ms (60Hz).

◆ECO Mode

When the UPS is at AC Mode and the requirement to the load is not critical, the UPS can be set at ECO mode in order to increase the efficiency of the power supplied. At ECO mode, the UPS works at Line-interactive mode, so the UPS will transfer to bypass supply. When the AC is out of set window, the UPS will transfer from bypass to Inverter and supplies power from the battery, then the LCD shows all related information on the screen.

◆Parallel redundancy mode (system expansion)

To achieve a higher capacity and / or increase reliability, the outputs of up to four UPS modules can be programmed to operate in parallel and the built-in parallel controller in each UPS ensures automatic load sharing.

◆Maintenance mode (Manual Bypass)

A manual bypass switch is available to ensure continuity of supply to the critical load when the UPS is out of order or in repair, and this manual bypass switch bears for equivalent rated load.

4.2 Turn on/off UPS

4.2.1 Restart procedure

CAUTION!

MAKE SURE GROUNDING IS PROPERLY DONE!

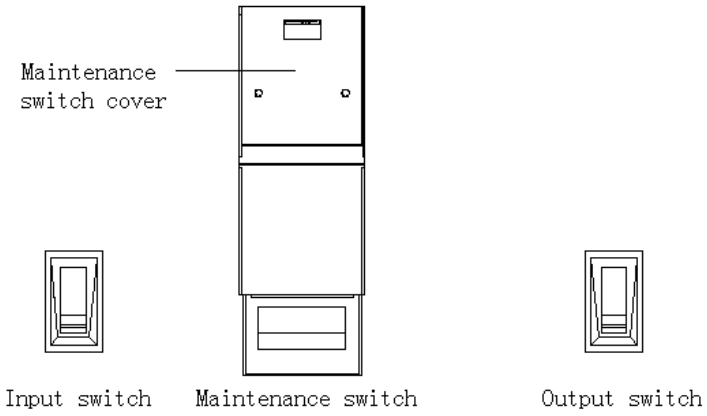
◆ Set the Battery Breaker to the “ON” position according to the user’s manual.

◆ Open the front and rear doors of the UPS to access to the main power switches. During this procedure the output terminals will become alive.

CAUTION！

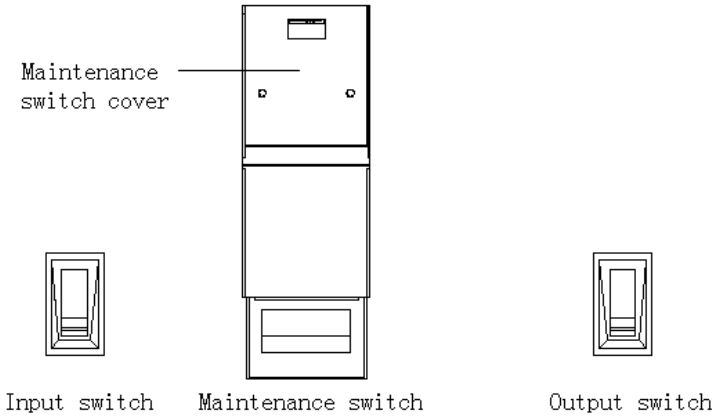
Check to see if the load is safely connected with the output of the UPS. If the load is not ready to receive power from the UPS, make sure that it is safely isolated from the UPS output terminals

◆ UPS Input Switch(below the UPS module at the front door)



If the Rectifier input is within voltage range, the rectifier will start up in 30 seconds then the inverter will start up after then.

◆ UPS Output Switch(below the UPS module at the front door)



If the recetifier fails at startup, the bypass LED will light up. When the inverter starts up, the UPS will transfer from bypass mode to inverter mode, then the bypass LED extinguishes and the inverter LED lights up.

No matter whether the UPS can work normally or not, all the status will be shown on the

LCD display.

4.2.2 Test procedure

CAUTION!

The UPS is operating normally.

It may take 60 seconds to boost up the system and perform self-test completely.

◆ Switch off the MAINS to simulate utility failure, the rectifier will turn off and the battery should feed the inverter without interruption. At this time, the LEDs of battery should be turned on.

◆ Switch on the MAINS to simulate utility recovery, the rectifier will restart automatically after 20 seconds and the inverter will supply to the load. It is suggested to use Dummy loads for testing. The UPS can be loaded up to its maximum capacity during load test。

4.2.3 MAINTENANCE BYPASS

To supply the load via Mains, you may simply active the internal mechanical bypass switch.

CAUTION!

The load is not protected by the UPS when the internal mechanical bypass system is active and the power is not conditioned.

Switch to mechanical bypass

CAUTION!

If the UPS is running normally and can be controlled through the display, carry out steps 1 to 5; otherwise, jump to Step 4.

◆ Open the cover of maintenance switch, the UPS turns to bypass mode automatically.

◆ Turn on MAINTENANCE breaker;

◆ Open BATTERY breaker;

◆ Switch OFF the MAINS breaker,

◆Switch OFF OUTPUT breaker;

At this time the bypass source will supply to the load through the MAINTENANCE

breaker.

Switch to normal operation (from mechanical bypass)

CAUTION!

Never attempt to switch the UPS back to normal operation until you have verified that there are no internal UPS faults

◆ Open the front door of the UPS to be easily access to the main power switch.

◆ Switch ON the output breaker of the module.

◆ Switch ON the input breaker.

The UPS powers from the static bypass instead of the maintenance bypass, then the bypass LED will light up.

◆ Switch OFF the maintenance bypass breaker, then the output is supplied by the bypass of the modules.

◆ Put on the maintenance switch cover.

The rectifier will operate normally after 30 seconds. If the inverter works normally, the system will be transferred from bypass mode to normal mode.

4.2.4 Black(Cold) start procedure

CAUTION!

Follow these procedures when the input AC Utility Failure, but battery is normal

◆ Turn on the battery switch.

The battery will feed the Auxiliary power board.

◆ Turn on the Output switch

◆ Trigger the cold start button of the module as the position 5 of the above drawing.

When battery normal, rectifier starts operation, 30s later, inverter starts and operates and battery LED on

CAUTION!

Wait for approximately 30 seconds when close the battey switch before you press the black start key

4.2.5 Shut down procedure

CAUTION!

This procedure should be followed to completely shut down the UPS and the LOAD. After all power switches, isolators and circuit breakers are opened, there will

be no output.

- ◆ Open the BATTERY breaker;
- ◆ Open the UPS door to easily access to the main power switch;
- ◆ Switch OFF the input breaker.
- ◆ Open the OUTPUT power switch. The UPS shuts down;
- ◆ To completely isolate the UPS from AC Mains, all input switches of Utility shall be completely off, which includes the ones for rectifier and bypass.
- ◆ The primary input distribution panel, which is often located far away from the UPS area, so a label should be posted to advise service personnel that the UPS circuit is under maintenance。

WARNING!

Wait for about 5 minutes for the internal D.C. bus bar capacitors to be completely discharged.

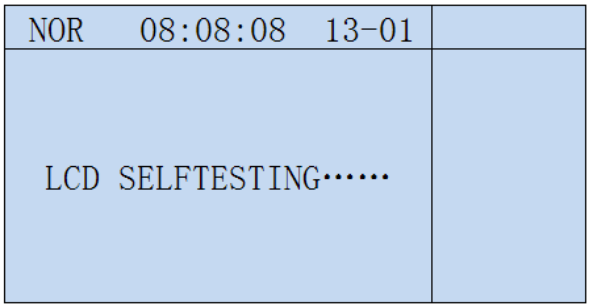
4.3 The Display

4.3.1 LCD display

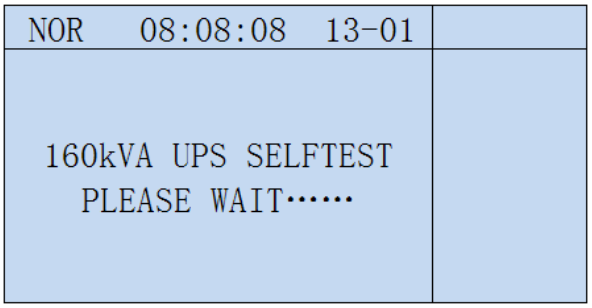
Introduction

CAUTION!

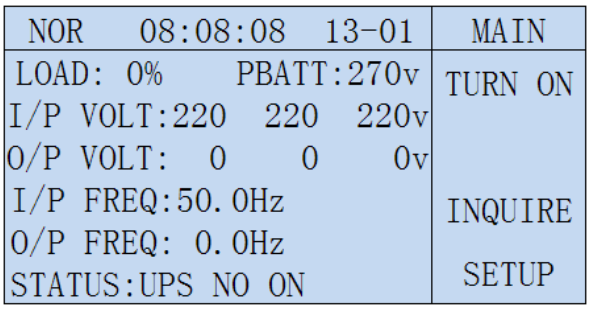
The display provides more functions than those described in this manual



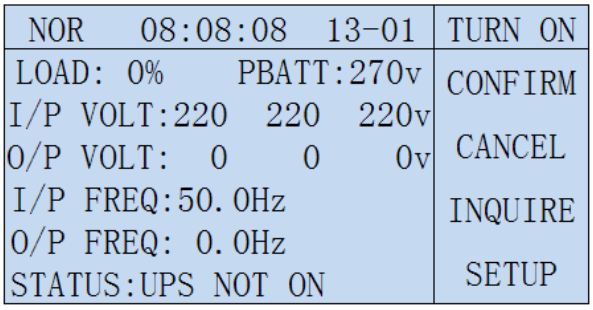
LCD SELFTEST



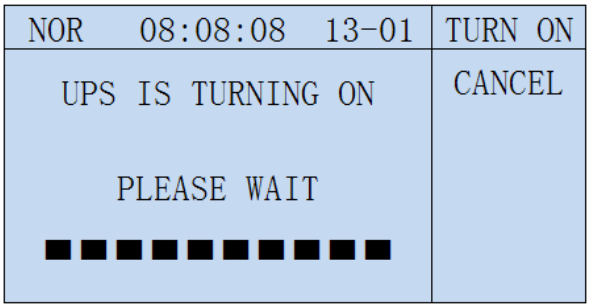
UPS SELFTEST



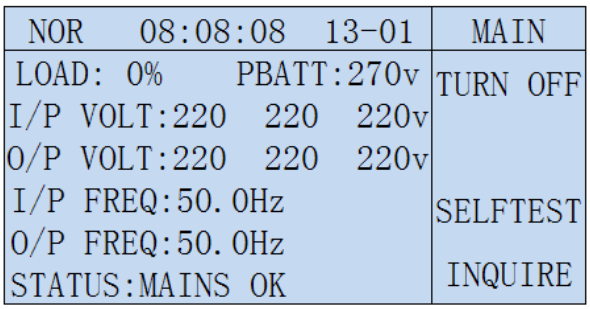
TURN ON UPS



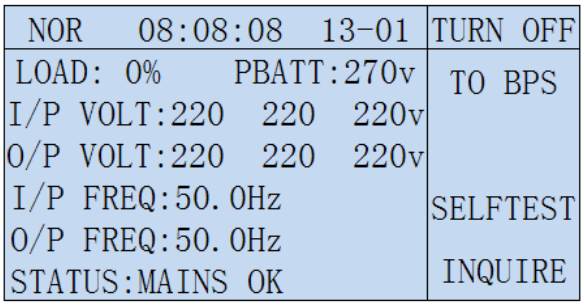
INVERTER TURN ON



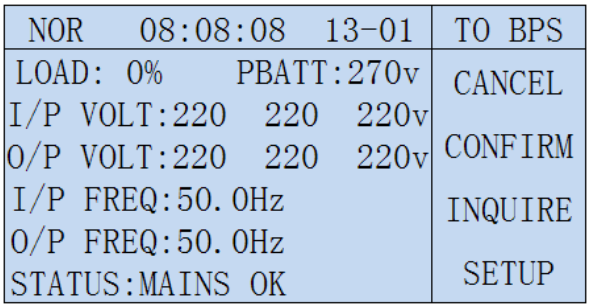
INVERTER TURNING ON



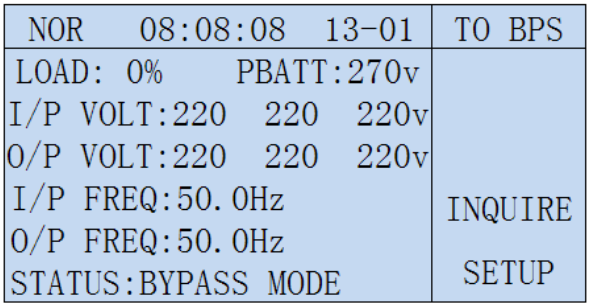
INVERTER TURN OFF



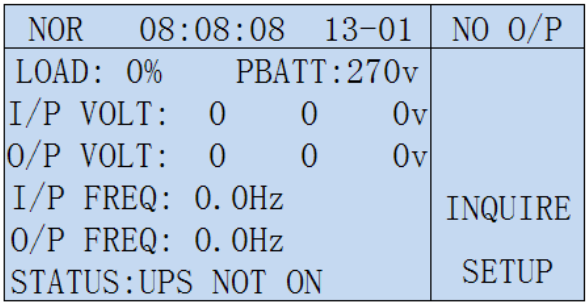
TURN TO BYPASS



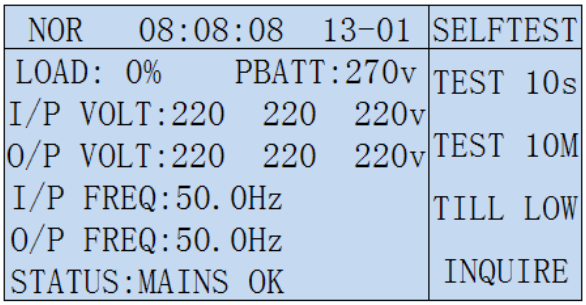
CONFIRM TURN TO BYPASS



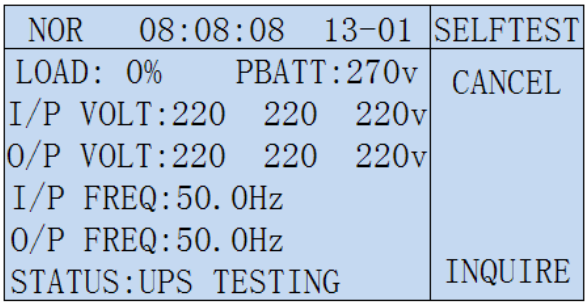
BYPASS MODE



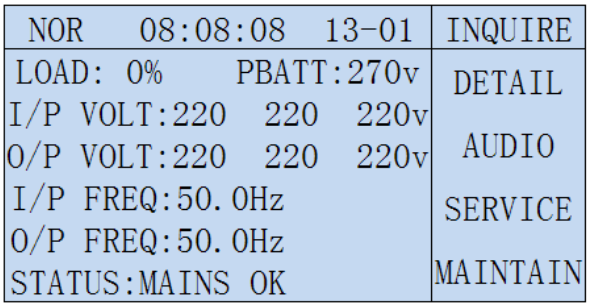
TURNING OFF



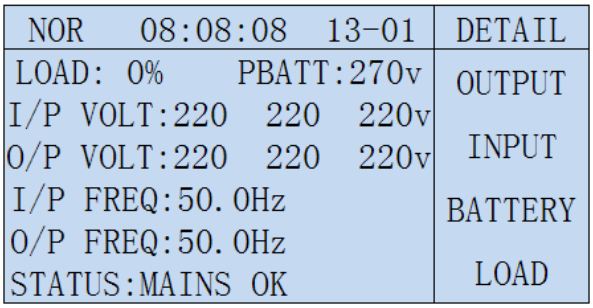
SELFTEST



SELFTEST----UPS TESTING



INQUIRE



INQUIRE---- DETAIL

NOR 08:08:08 13-01	OUTPUT
ITEM: AN BN CN	INPUT
O/P VOLT:220 220 220v	BATTERY
O/P CURR: 0 0 0A	LOAD
O/P FREQ:50.0Hz	MAIN
STATUS:MAINS OK	

INQUIRE---- OUTPUT

NOR 08:08:08 13-01	INPUT
ITEM: AN BN CN	OUTPUT
I/P VOLT:220 220 220v	BATTERY
I/P CURR: 0 0 0A	LOAD
I/P FREQ:50.0Hz	MAIN
STATUS:MAINS OK	

INQUIRE---- INPUT

NOR 08:08:08 13-01	BATTERY
PBATT VOLT:270v 6A	OUTPUT
NBATT VOLT:270v 6A	INPUT
STATUS:CHARGING	LOAD
CAP:100%	MAIN
REMAINING TIME:100Min	
STATUS:MAINS OK	

INQUIRE----BATTERY

NOR 08:08:08 13-01	LOAD
kW kVA	OUTPUT
A: 0.00 0.00	INPUT
B: 0.00 0.00	BATTERY
C: 0.00 0.00	STATIC
STATUS:MAINS OK	

INQUIRE----LOAD

NOR 08:08:08 13-01	AUDIO
LOAD: 0% PBATT:270v	ALARM ON
I/P VOLT:220 220 220v	DETAIL
O/P VOLT:220 220 220v	SERVICE
I/P FREQ:50.0Hz	MAINTAIN
O/P FREQ:50.0Hz	
STATUS:MAINS OK	

INQUIRE ----ALARM OFF

NOR 08:08:08 13-01	AUDIO
LOAD: 0% PBATT:270v	ALARM OFF
I/P VOLT:220 220 220v	DETAIL
O/P VOLT:220 220 220v	SERVICE
I/P FREQ:50.0Hz	MAINTAIN
O/P FREQ:50.0Hz	
STATUS:MAINS OK	

INQUIRE ----ALARM ON

NOR 08:08:08 13-01	SERVICE
MODEL:160kVA UPS VER:01	DETAIL
SERIAL:00000000000000	AUDIO
RELAILER PHONE:	MAINTAIN
	MAIN

INQUIRE----SERVICE

NOR 08:08:08 13-01	MAINTAIN
NOW WARN:0	CURRENT
HISTORY:1	HISTORY
CONVERTER MODE:ON	ADVANCE
O/P FREQ:50.0Hz	OTHER
STATUS: FAULT	

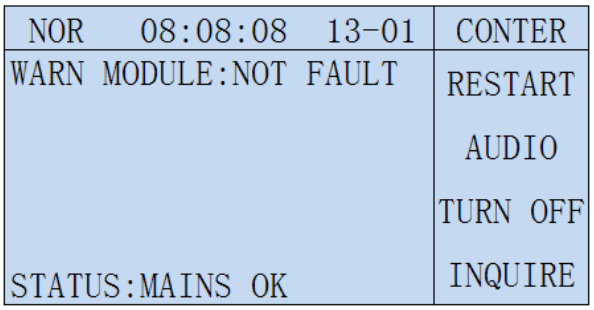
MAINTAIN

NOR 08:08:08 13-01	CURRENT
WARN MODULE:NOT FAULT	
	WARN
	CONTER
STATUS:MAINS OK	OTHER

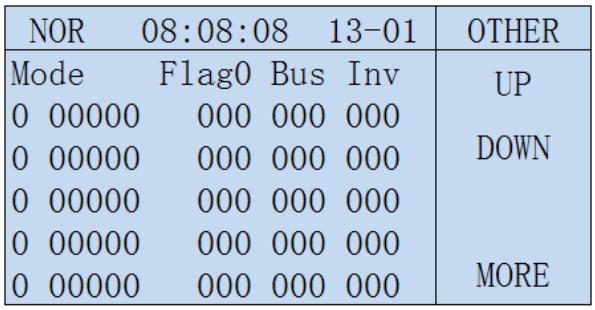
MAINTAIN----CURRENT INFO.

NOR 08:08:08 13-01	WARN
MODULE WARN CORD	MORE
UPS1	
UPS2	
UPS3	CONTER
UPS4	
UPS5	OTHER

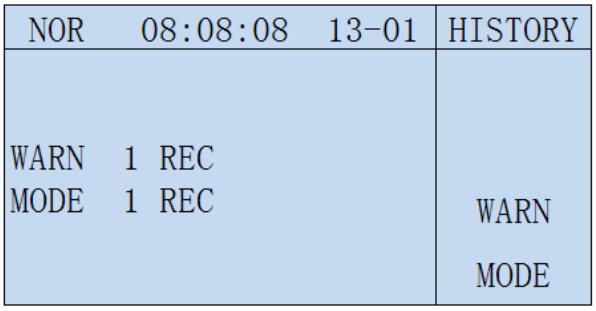
MAINTAIN----WARN



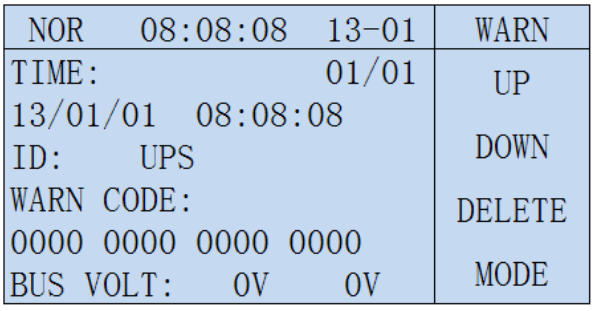
MAINTAIN----CONTER



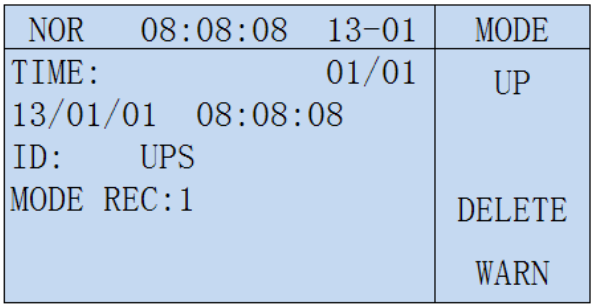
MAINTAIN----OTHER



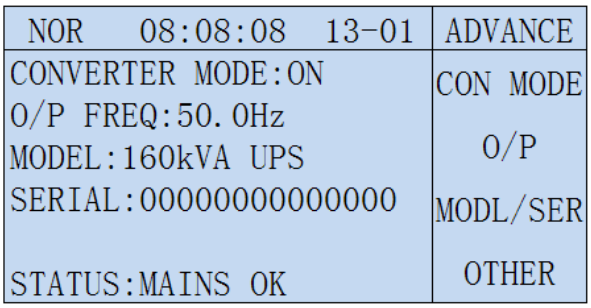
MAINTAIN----HISTORY



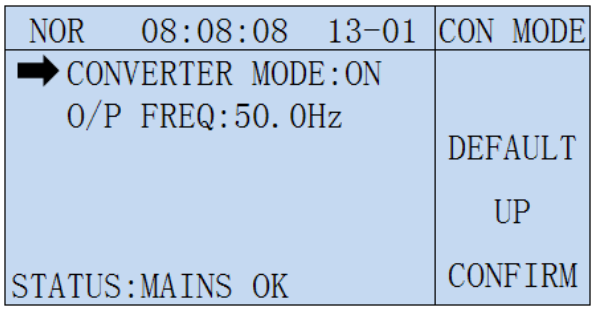
HISTORY----WARN



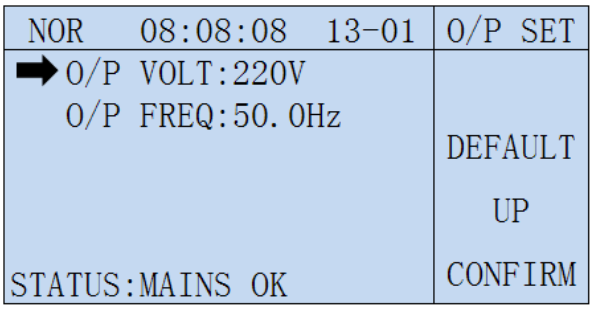
HISTORY----MODE



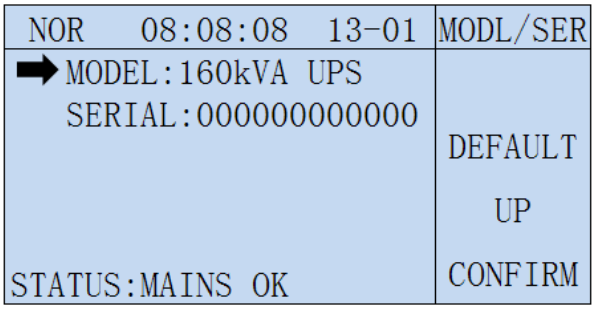
ADVANCE



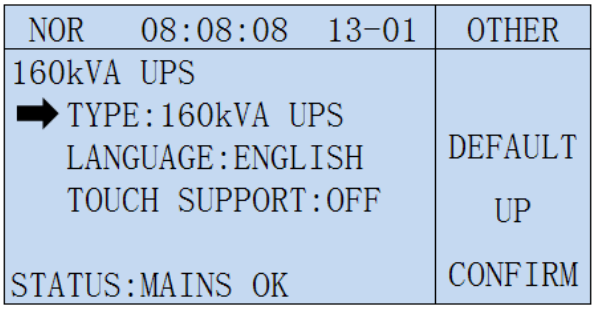
ADVANCE----CONVERTER



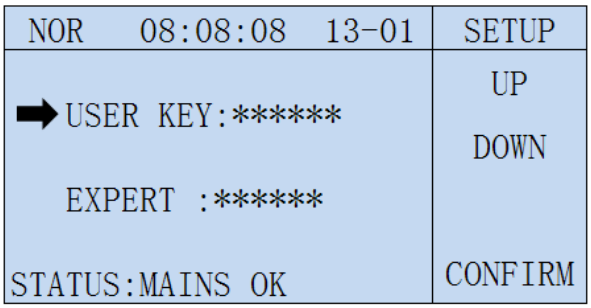
ADVANCE----OUTPUT



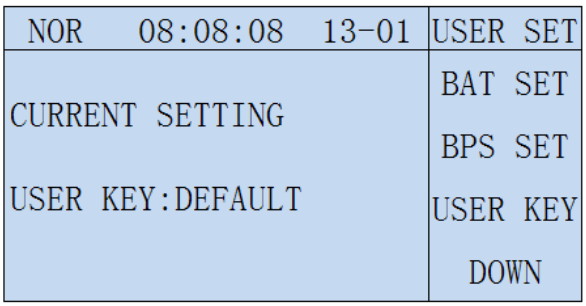
ADVANCE----MODL/SER



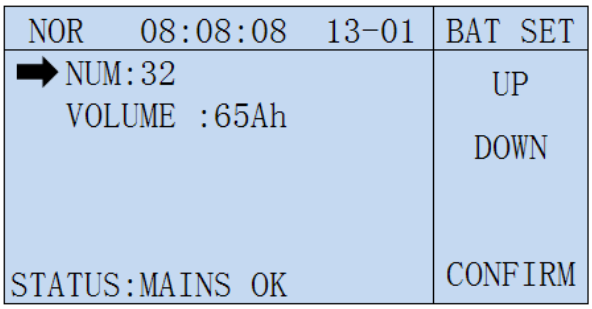
ADVANCE----OTHER



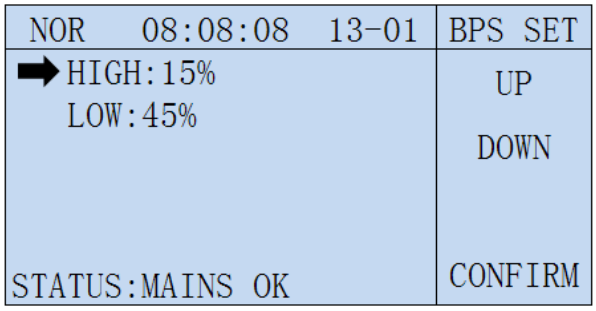
SETUP



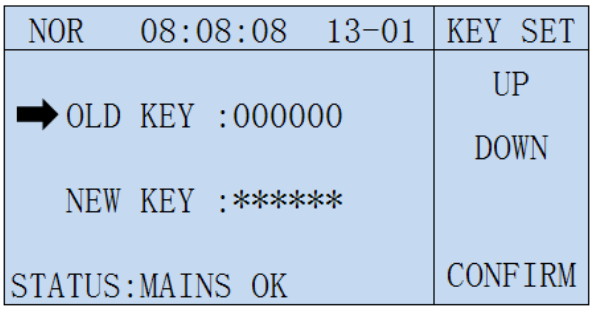
SETUP----USER SET



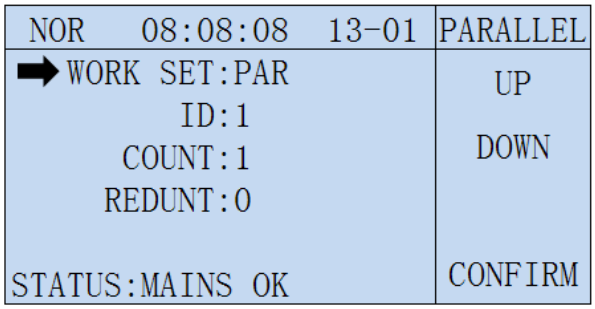
SETUP----BATTERY SET



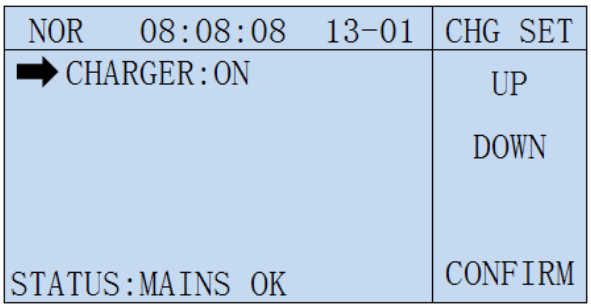
SETUP----BYPASS SET



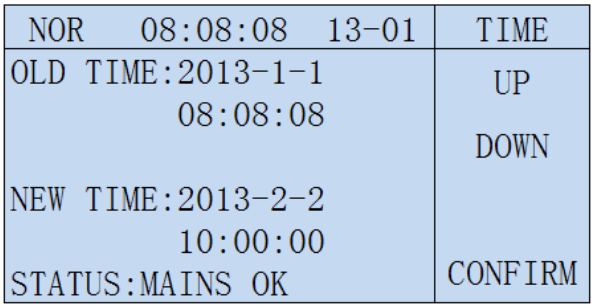
SETUP----USER KEY SET



SETUP----PARALLEL SET



SETUP----CHGRGER SET



SETUP----TIME SET

Alarm Information

Event log	UPS Alarm Warning	Buzzer	LED
1	Rectifier Fault	Beep continuously	Fault LED lit
2	Inverter fault(Including Inverter bridge is shorted)	Beep continuously	Fault LED lit
3	Inverter Thyristor short	Beep continuously	Fault LED lit
4	Inverter Thyristor broken	Beep continuously	Fault LED lit
5	Bypass Thyristor short	Beep continuously	Fault LED lit
6	Bypass Thyristor broken	Beep continuously	Fault LED lit
7	Fuse broken	Beep continuously	Fault LED lit
8	Parallel relay fault	Beep continuously	Fault LED lit
9	Fan fault	Beep continuously	Fault LED lit
10	Reserve	Beep continuously	Fault LED lit
11	Auxiliary power fault	Beep continuously	Fault LED lit
12	Initializtion fault	Beep continuously	Fault LED lit
13	P-Battery Charger fault	Beep continuously	Fault LED lit
14	N-Battery Charger fault	Beep continuously	Fault LED lit
15	DC Bus over voltage	Beep continuously	Fault LED lit
16	DC Bus below voltage	Beep continuously	Fault LED lit
17	DC bus unbalance	Beep continuously	Fault LED lit
18	Soft start failed	Beep continuously	Fault LED lit
19	Rectifier Over Temperature	Beep continuously	Fault LED lit
20	Inverter Over temperature	Twice per second	Fault LED lit
21	Reserve	Twice per second	Fault LED lit
22	Battery reverse	Twice per second	Fault LED lit
23	Cable connection error	Twice per second	Fault LED lit
24	CAN comm. Fault	Twice per second	Fault LED lit
25	Parallel load sharing fault	Twice per second	Fault LED lit
26	Battery over voltage	Twice per second	Fault LED blinking
27	Mains Site Wiring Fault	Once per second	Fault LED blinking
28	Bypass Site Wiring Fault	Once per second	Fault LED blinking
29	Output Short-circuit	Once per second	Fault LED blinking

30	Rectifier over current	Once per second	Fault LED blinking
31	Bypass over current	Once per second	BPS LED blinking
32	Overload	Once per second	INV or BPS LED blinking
33	No battery	Once per second	Battery LED blinking
34	Battery under voltage	Once per second	Battery LED blinking
35	Battery low pre-warning	Once per second	Battery LED blinking
36	Internal Communication Error	Once per second	Fault LED blinking
37	DC component over limit.	Once per 2 seconds	INV LED blinking
38	Parallel Overload	Once per 2 seconds	INV LED blinking
39	Mains volt. Abnormal	Once per 2 seconds	Battery LED lit
40	Mains freq. abnormal	Once per 2 seconds	Battery LED lit
41	Bypass Not Available	Once per 2 seconds	BPS LED blinking
42	Bypass unable to trace		BPS LED blinking
43	Inverter on invalid		
44	Module screw unlock		
45	UPS not work		

4.4 Options

SNMP card: internal SNMP / external SNMP optional

◆ Loosen the 2 torque screws (on each side of the card).

◆ Carefully pull out the card. Reverse the procedure for re-installation

The slot called SNMP supports the MEGAtec protocol.

Fig18:the overview of the SNMP card

Relay card

The card is used for providing the interface for UPS peripheral monitoring. The contact signals can reflect UPS running status. The card is connected to peripheral monitoring devices via DB9 female to facilitate the effective monitoring of the real-time status of UPS and timely feedback the status to monitor when abnormal situation occurs (such as UJPS failure, mains interruption, UPS bypass and ect.). It is installed in the intelligent slot of the UPS.

The relay card includes 6 output ports and one input port. Please refer to the following table for detail.

Fig19:the overview of the relay card

DB9 interface: Connect to upper control terminal. The definition of the pins is defined as below:

Pin-out	Function description	Input/Output
1	UPS Failure	Output
2	Summary Alarm	Output
3	GND	
4	Remote Shutdown	Input
5	Common	
6	Bypass	Output
7	Battery Low	Output
8	UPS ON	Output
9	Utility Failure	Output

Figure 20：Relay card appearance

Appendix 1 Specifications

Model			HI3310	HI3312	HI3316
Capacity			100kVA 90kW	120kVA 108kW	160kVA 144kW
Input	Phase		3 Phase 4 Wires and Ground		
	Rated Voltage		380/400/415Vac		
	Voltage Range		208~478Vac		
	Frequency Range		40Hz-70Hz		
	Power Factor		≥0.99		
	Current THDi		≤3%(100% nonlinear load)		
	Bypass Voltage Range		Max.voltage:220V:+25%(optional +10%,+15%,+20%); 230V:+20%(optional +10%,+15%); 240V:+15%(optional +10%); Min. voltage:-45%(optional -20%,-30%) Frequency protection range: ±10%		
Output	Phase		3 Phase 4 Wires and Ground		
	Rated Voltage		380/400/415Vac		
	Power Factor		0.9		
	Voltage Regulation		±1%		
	Frequency	Utility Mode	±1%/±2%/±4%/±5%/±10%of the rated frequency(optional)		
		Battery Mode	(50/60±0.1)Hz		
	Crest Factor		3:1		
	THD		≤2% with linear load ≤5% with non linear load		
Efficiency			≥95% at normal mode		
Battery	Voltage		±192V/±204V/±216V/±228V/±240VDC (32 /34/36/38/40PCS)		
	Charge Current(A)		24A max	30A max	36A max
Transfer Time			Utility to Battery : 0ms; Utility to bypass: 0ms		
Protection	Overload	AC Mode	Load≤110%: last 60min,≤125%: last 10min,≤150%: last 1min，≥150% shut down UPS immediately.		
		Bat. Mode	Load≤110%: last 10min,≤125%: last 1min,≤150%: last 5s,≥150% shut down UPS immediately.		
		Bypass Mode	225A		250A
	Short Circuit		Hold Whole System		
	Overheat		Line Mode: Switch to Bypass; Backup Mode: Shut down UPS immediately		
	Battery Low		Alarm and Switch off		
	Self-diagnostics		Upon Power On and Software Control		
	EPO(optional)		Shut down UPS immediately		

Model		HI3310	HI3312	HI3316
Capacity		100kVA 90kW	120kVA 108kW	160kVA 144kW
Protection	Battery	Advanced Battery Management		
	Noise Suppression	Complies with EN62040-2		
Comunication Interface		USB, RS485,Parallel,SNMP card(optional),Relay card(optional)		
Environment	Operating Temperature	0 ℃40 ℃		
	Storage Temperature	-25 ℃55 ℃		
	Humidity	0～95% non condensing		
	Altitude	< 1500m		
Display	Audible & Visual	Line Failure, Battery Low, Overload, System Fault		
	Status LED & LCD	Line Mode, Bypass Mode, Battery Low, Battery Bad, Overload & UPS Fault		
	Reading On the LCD	Input Voltage,Input Frequency,Output Voltage,Output Frequency,Load Percentage,Battery Voltage,parameter set, history record…		
Other	Unit Dimensions(W*D*H)	600*780*1600		
	Weight (Kg)	286	316	348
Safety Conformance		CE,EN/IEC 62040-2,EN/IEC 62040-1-1		

Appendix 2 Problems and Solution

In case the UPS can not work normally, it might be wrong in installation, wiring or operation. Please check these aspects first. If all these aspects are checked without any problem, please consult with local agent right away and provide below informations.

（1） Product model name and serial number.

（2） Try to describe the fault with more details, such as LCD display info, LED lights status, etc.

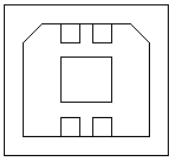
Read the user manual carefully, it can help a lot for using this UPS in the right way. Some FAQ (frequently asked questions) may help you to troubleshoot your problem easily.

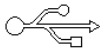
No.	Problem	Possible reason	Solution
1	Utility is connected but the UPS can not be powered ON.	Input power supply is not connected; Input voltage low; The input swith of the module is not switched on .	measure if the UPS input voltage/frequency are within the window. Check if all modules input are switched on
2	Utility normal but Utiltiy LED does not light on, and the UPS operates at battery mode	The input breakers of the Modules are not switched on; input cable is not well connected	Switch on the input breaker; Make sure the input cable is well connected.
3	The UPS does not indicate any failure, but output do not have voltage	Output cable does not well connected	Make sure the output cable is well connected.
4	The UPS module can not transfer to bypass or inverter	Module does not well inserted; The left coronal screw is not tight. Output breaker do not switch on	Pull out the module and insert again; Tighten the screw; Switch on the output breaker.
5	Utility LED is flashing	Utility voltage exceeds UPS input range.	If the UPS operates at battery mode, please pay attention to the remaining backup time needed for your system.
6	Battery LED is flashing but no charge voltage and current	Battery breaker does not switch on, or batteries are damaged, or battery is reversely connected. battery number and capacity are not set correctly.	Switch on the battery breaker. If batteries are damaged, need to replace whole group batteries, Connect the battery cables correctly; Go to LCD setting of the battery number and capacity, set the correct data.

7	Buzzer beeps every 0.5 seconds and LCD display “output overload”	Overload	remove some load
8	Buzzer long beeps, LCD display “output short circuit”	The UPS output is in short circuit	Make sure the load is not in short circuit, then restart the UPS.
9	The LED of the Module with RED light	The module is not inserted properly.	Pull out the module and insert properly.
10	The UPS only works on bypass mode	The UPS is set to ECO mode	Set the UPS working mode to Single Module type(non-parallel)
11	Can not Black start	Battery switch is not properly closed； Battery fuse broken down； Or Battery low	Close the battery switch； Change the fuse； Recharge the battery
12	Buzzer beeps continuously and LCD indicates Rectifer fault or output fault	UPS is out of order	Consult with your local agent for repair

Appendix 3 USB communication port definition

Definition of USB port：





Connection between PC USB port and UPS USB port.

PC USB port	UPS RS232 port	Description
Pin 1	Pin 1	PC : +5V
Pin 2	Pin 2	PC : DPLUS signal
Pin 3	Pin 3	PC :DMINUS signal
Pin 4	Pin 4	Signal ground

Available function of USB

- ◆ Monitor UPS power status。
- ◆ Monitor UPS alarm info。
- ◆ Monitor UPS running parameters。
- ◆ Timing off/on setting。

RS-232 communication data format

Baud rate ---------- 9600bps

Byte length ---------- 8bit

End bit ---------- 1bit

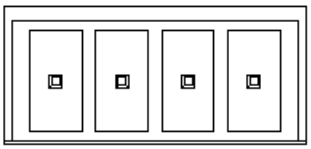
Parity check ---------non

CAUTION！

USB & RS232 & RS485 ports cannot be used at the same time.

Appendix 4 RS232 communication port definition

Definition of port：



1 2 3 4

Connection between the Device’s RS232 port and UPS RS232 port.

device（RJ45)	UPS（RJ45）	Description
Pin 2	Pin 1	UPS-“TX”,PC-“RX”
Pin 3	Pin 2	UPS-“RX”,PC-“TX”
Pin5	Pin4	GND

Available function of RS485

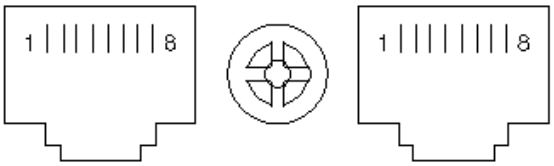
- ◆ Monitor UPS power status。
- ◆ Monitor UPS alarm info。
- ◆ Monitor UPS running parameters。
- ◆ Timing off/on setting。

CAUTION！

USB & RS232 & RS485 ports cannot be used at the same time.

Appendix 5 RS485 communication port definition

Definition of port：



Connection between the Device’s RS485 port and UPS RS485 port.

device（RJ45)	UPS（RJ45）	Description
Pin 1/5	Pin 1/5	485+ “A“
Pin 2/4	Pin 2/4	485 -“B”

Available function of RS485

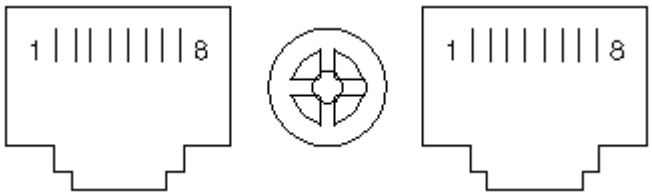
- ◆ Monitor UPS power status。
- ◆ Monitor UPS alarm info。
- ◆ Monitor UPS running parameters。
- ◆ Timing off/on setting。

CAUTION！

USB & RS232 & RS485 ports cannot be used at the same time.

Appendix 6 LBS communication port definition

Definition of port：



Connection between the UPS1's LBS1 port and UPS2's LBS2 port.

UPS1 LBS1（RJ45)	UPS2 LBS2（RJ45）	Description
Pin 1/5	Pin 1/5	LBS_BPSIDE_BC
Pin 2/4	Pin 2/4	LBS_TRACE_BC
Pin 8	Pin 8	GND

Available function of LBS

◆The output power of two or more UPS in non-parallel system should be synchronized with each other.

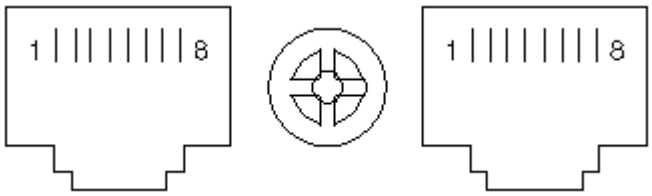
◆The output phase of two or more UPS in non-parallel system should be synchronized with each other.

CAUTION！

Two or more LBS cables must be used to form a ring when two or more LBS in non-parallel system .

Appendix 7 BAT_T communication port definition

Definition of port：



Connection between the UPS1’s LBS1 port and UPS2’s LBS2 port.

Temperature sentor（RJ45)	UPS2 BAT_T（RJ45）	Description
Pin 1/5	Pin 1/5	TX
Pin 2/4	Pin 2/4	RX
Pin 7	Pin 7	12V
Pin 8	Pin 8	GND

Available function of BAT_T

◆Battery environment temperature monitoring.

◆Charging voltage modulation depending on batteries’ temperature

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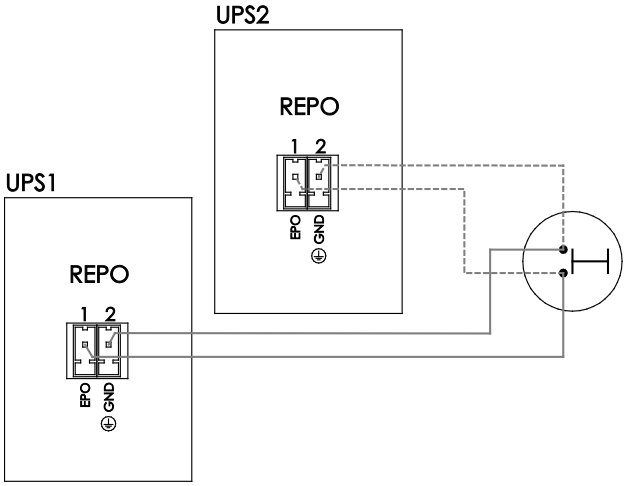
Appendix 8 REPO instruction

Definition of port：

Connection diagram：



Connection between the button and UPS REPO port.

Button	UPS REPO	Description
Pin 1	Pin 1	GND
Pin 2	Pin 2	EPO

◆In addition to the local EPO push button on the front panel of the UPS (that stops operation of that module when pressed for more than 3 second), the UPS also supports a remote emergency stop (REPO).

◆A remote emergency stop switch (Dry contact signal and “normally open” - not provided) can be installed in a remote location and connection through simple wires to the REPO connector.

◆The remote switch can be connected to several UPS’s in a parallel architecture allowing the user to stops all units at once.

◆Additionally, a second system (not provided) can be connected to the remote switch to disconnect the main input and the secondary (bypass) input sources